Premium Power
Distributed Energy Storage System

Project Description
Premium Power and its partners will demonstrate a multi-hour, zinc bromide battery-based energy storage system (ESS) for load shifting, peak shaving, renewable system integration, and support for micro-grid operations. The project is based on Premium Power's trailer-mounted 500 kW, 6-hr TransFlow 2000 energy storage system, providing capacity on demand. The TransFlow 2000 is a fully integrated system that comprises energy storage, power conditioning, system control, and thermal management subsystems. Two utilities will demonstrate this technology, National Grid and Sacramento Municipal Utility District (SMUD). Three ESSs are to be demonstrated with National Grid at locations in Massachusetts. Two ESS's will be integrated into a single 1MW/6 hr system installed next to a 605 kW photovoltaic (PV) array in Everett, MA and the other ESS will be interfaced with a 600 kW wind turbine at the Holy Name High School feeder in Worcester, MA. Two ESS's will be installed in Sacramento, California, one at the SMUD headquarters substation serving the SMUD campus micro-grid and one at a substation serving the Anatolia III SolarSmart Homes℠ community development that will have 600 homes totaling 1.2 MW of photo-voltaic (PV) generating capacity. The headquarters storage system will improve micro-grid operations, emergency operations, and augment peak period campus operation with non-peak generated electricity. National Grid and SMUD will deploy, operate, and monitor the TF2000 units in their respective systems for two years.

Goals/Objectives
- Demonstrate competitively priced, multi-megawatt, long-duration batteries for utility grid applications
- Validate the potential of zinc bromide flow batteries
- Demonstrate multiple approaches to battery integration with intermittent renewable energy systems with aggregated homes, in a micro-grid, and at a substation
- Develop and verify creative control algorithms to manage fleet operation of energy storage systems that are not co-located

Key Milestones
- Detailed engineering design complete (December 2011)
- Completion and delivery of ESS unit 1 (March 2012)
- Installation and integration of all five units complete (August 2012)
- Test operations complete (October 2014)

Benefits
- Jobs created
- Power quality improved
- Cost of electricity reduced
- Electricity reliability improved

CONTACTS
Kimberly Nuhfer
Project Manager
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880
304-285-6544
Kimberly.Nuhfer@netl.doe.gov

Dennis McKay
Principal Investigator
Premium Power
87 Concord Street
North Reading, MA 01864-2601
978-664-5000
dmckay@premiumpower.com

PARTNERS
National Grid USA Service Company Inc
Sacramento Municipal Utility District
Worcester Polytechnic Institute
Science Applications International Corp
National Renewable Energy Laboratory

PROJECT DURATION
8/13/10–10/04/2014

BUDGET
Total Project Value
$12,514,660

DOE/Non-DOE Share
$6,062,552/$6,452,108

EQUIPMENT
TransFlow 2000 Flow Batteries
Advanced Metering Equipment and Sensors
Transformers
Switchgear
Circuit Breaker/Protective Relays

DEMONSTRATION STATES
California
Massachusetts

CID: OE0000224

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